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ABSTRACT

Intended to reduce unnecessary paper work on the part of the shop instructor in a masonry course, this job assignment book offers a simplified method of keeping student records up-to-date. It lists theory objectives and specific objectives for masonry courses in grades 10, 11, and 12. To help the instructor in planning and organizing in advance, a theory outline is offered that covers 19 topics, including introduction, occupational safety, masonry materials, masonry tools, layout, masonry walls, bonds and patterns, solar construction, reinforced masonry construction, arch construction, fireplace construction, masonry estimating, lintel and beam installation, door and window frames, repair and maintenance, and customer relations. Space is provided for each topic to indicate lesson plan number and dates scheduled, presented, and tested. Other contents include instructions for recording student progress on the shop progress records; a record/form with areas for student name, tool check number, locker number, and text number, and grades; and shop progress records. The shop progress records identify the operations/skills that the student in a masonry course is expected to learn and provide a space in which the instructor records student progress as (1) instructed, (2) practiced, or (3) proficient. (YLB)

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MASONRY

DIVISION OF VOCATIONAL-TECHNICAL SCHOOLS

Prepared for

Connecticut State Department of Education
Division of Vocational and Adult Education
Bureau of Vocational Program Planning and Development
Hartford, Connecticut 06115

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1983

MASONRY

Progress Record, Theory Outline

SCHOOL _____

SHOP _____

INSTRUCTOR _____ YEAR _____ GRADE _____

INSTRUCTOR _____ YEAR _____ GRADE _____

INSTRUCTOR _____ YEAR _____ GRADE _____

INSTRUCTOR _____ YEAR _____ GRADE _____

CONNECTICUT STATE DEPARTMENT OF EDUCATION
DIVISION OF VOCATIONAL TECHNICAL SCHOOLS
HARTFORD, CONNECTICUT

1983

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PREFACE

The objective of this Job Assignment Book is to reduce unnecessary paper work on the part of the shop instructor.

This Job Assignment Book will simplify the instructor's task of keeping student records up-to-date.

In shops doing production work, it is necessary to devise flexible daily lesson plans well in advance. This Job Assignment Book will help the instructor in planning and organizing considerably in advance, thereby increasing his/her instructional efficiency.

Please note that the book is not designed simply for planning. It has areas for locker, text assignments, notes, grades, shop progress records, daily attendance, etc.

Students' names are entered only once for the entire course.

THEORY OBJECTIVES

1. To provide the student with current related technical information.
2. To provide the student with the information necessary to perform jobs in an orderly and organized manner.
3. To provide the students with the information which will enable them to make correct judgments as related to solving job problems.
4. To provide the student with the information that is necessary to achieve desirable work habits, self-confidence and motivation.

MASONRY COURSE SPECIFIC OBJECTIVES

Upon completion of each grade level the student should be able to

GRADE 10

1. Be safety conscious and use safe work practices at all times.
2. List and identify the most often used tools of the masonry trade.
3. Use the essential measuring tools of the masonry trade.
4. Mix and spread mortar.
5. Lay brick to a line.
6. Build shop projects in a workship like manner.

GRADE 11

1. Be safety conscious and use safe work practices at all times.
2. Lay brick and block true to a line and accurately plumb, level and range masonry projects.
3. Maintain accurate heights while building leads.
4. Understand and apply basic theory related to the masonry trade.
5. Perform manipulative skills common to the masonry trade.
6. Build at least four types of arches.

GRADE 12

1. Be safety conscious and use safe work practices at all times.
2. Understand and apply basic theory ralated to the masonry trade.
3. Be able to solve job problems relating to masonry principles and materials.
4. Interpret and use working drawings to layout masonry work.
5. Build a complete fireplace.
6. Estimate material quantities and labor costs for small jobs.

MASONRY THEORY INDEX

I. Introduction
II. Occupational Safety
III. Masonry Materials
IV. Masonry Tools
V. Layout
VI. Masonry Wall Construction
VII. Bonds and Patterns
VIII. Solar Construction
IX. Reinforced Masonry Construction
X. Arch Construction
XI. Fireplace Construction
XII. Outdoor Bar-B-Que Construction
XIII. Heatilator Construction and Installation
XIV. Masonry Estimating and Shop Blue Print Reading
XV. Lintel and Beam Installation
XVI. Door and Window Frames
XVII. Repair and Maintenance
XVIII. Miscellaneous Assignments

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

I. INTRODUCTION

1. Orientation
   a. Shop Rules
   b. Shop facility
   c. Shop equipment
   d. History of trade
   e. Trade
2. Opportunities
   a. Working for union contractors
   b. Working for non-union (open shop) contractors
   c. Self-employed

II. OCCUPATIONAL SAFETY

1. Safety Precautions
   a. Safe working conditions
   b. Unsafe conditions
   c. Unsafe acts
2. Safety Laws
   a. Employees responsibilities
   b. Employers responsibilities
3. Protective Clothing and Equipment
   a. Shoes
   b. Hats
   c. Eye protection
   d. Hearing protection
   e. Respirators
4. Working, walking and climbing surfaces
   a. Stairs
   b. Ramps
   c. Ladders
   d. Staging and Protective Rails
   e. General housecleaning
   f. Lifting and carrying
   g. Color Coding
   h. Fires
   i. Work station

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

III. MASONRY MATERIALS

1. Construction Procedures and Application
   a. Brick
   b. Concrete Masonry Units (specials)
   c. Block
   d. Glazed Tile
   e. Glass Block
   f. Stone
      1. cut stone
      2. field stone
      3. decorating stone
      4. slate
   g. Ceramic tile
   h. Plastering materials
   i. Concrete

IV. MASONRY TOOLS

A. Trowels
B. Hammers
C. Chisels
D. Sets
E. Rules - spacing and modular
F. Lines
G. Corner blocks - line pins - trigs
H. Levels
I. Story poles
J. Jointers - flat, round, rakers

V. LAYOUT

A. Ruler and tape reading
B. Squaring
C. Leveling
D. Builders Level
E. Bench Marks
   1. Heights
F. Bonding
G. Story Pole
   1. Making
   2. Using

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

VI.MASONRY WALL Construction

A. Solid Brick
B. Concrete Masonry Units
C. Composite Wall
D. Cavity Wall
E. Load Bearing Wall
F. Partitions
G. Construction Procedures

VII. BONDS AND PATTERNS

A. History and Origin
B. Various bonds
C. Uses and applications
D. Patterns and desings

VIII. SOLAR CONSTRUCTION

A. Heating
B. Cooling
C. Insulation
D. Principles of Convection and Radiation
E. Trombe Wall
F. Concrete Eall
G. Fireplace Chimney Heat Sink
H. Shapes and Colors of Masonry Units
I. Tile, Concrete and Brick Floors
J. Orientation to the sun
K. Above Grade Building
L. Berm Construction
M. Subterranean Construction

IX. REINFORCED MASONRY Construction

A. Materials
    1. Steel
    2. Brick - Concrete Masonry Units
    3. Martar
    4. Grout

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

IX. REINFORCED MASONRY Construction (continued)

B. Placement of Reinforcement
C. Construction Procedures
    1. Low Lift Grouting
        a. Brick
        b. Block

X. ARCH CONSTRUCTION

A. History
B. Parts and dimensions
C. Layout arch centers
D. Segmental arch construction
E. Jack arch construction
F. Gothic arch construction
G. Elliptical arch construction
H. Construction Procedures and trade practices
    1. Layout arch ring
    2. Cutting units for arches
    3. Aligning
    4. Bonding patterns
    5. Building, placing and removing arch centers

XI. FIREPLACE CONSTRUCTION

A. History
B. Types
C. Safety
    1. State and local building codes
D. Planning and layout
    1. Height
    2. Width
    3. Depth
    4. Function

E. Hearth
    1. Length
    2. Width
    3. Function

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

XI. FIREPLACE CONSTRUCTION (Continued)

F. Function
- 1. Size
- 2. Width
- 3. Style
  - a. poker control
  - b. rotary control
  - c. multi-opening

G. Smoke Shelf
- 1. Minimum depth
- 2. Function

H. Smoke Chamber
- 1. Parging
- 2. Float smooth
- 3. Function

I. FLUE LININGS
- 1. Correct size
- 2. Proper location
- 3. Proper installation

J. Lintels
- 1. Length
- 2. Thickness
- 3. Function

K. Throat
- 1. Location
- 2. Function

L. Ash Dump
- 1. Location
- 2. Size
- 3. Function

M. Ash Pits
- 1. Location
- 2. Function
- 3. Partitions

N. Clean Out Doors
- 1. Location
- 2. Size
- 3. Function

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

XI.FIREPLACE CONSTRUCTION (Continued)

O. Mantels
1. Wood
2. Brick
3. Stone

XII. OUT DOOR BAR-B-QUE CONSTRUCTION

A. Types
B.Plans
1. Fire Box
2. Grills
3. Foundation
4. Chimneys

XIII. HEATILATOR CONSTRUCTION AND INSTALLATION

A. History
B. Planning
C. Economy
D. Insulation
E. Air Circulation
1. Air Intake
2. Warm Air Exhaust
A. Hearth
B. Exhaust
1. Intake
2. Exhaust
A. Flue Size

XIV. MASONRY ESTIMATING AND SHOP BLUE PRINT READING

A. Working Drawings
1. Sections
2. Elevations
3. Plans
4. Details
5. Scales
B. Estimating Materials
1. Square Foot Method
2. Linear Foot Method

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

XIV. MASONRY ESTIMATING (Continued)

C. Estimating Labor Costs
   1. Unit Price
   2. Units Per Day

D. Estimating Equipment Costs
   1. Forklift rental
   2. Staging rental

E. Payroll, Taxes, Insurance and Profit

XV. LINTEL AND BEAM INSTALLATION

A. Steel
   1. Length (Bearing)
   2. Strength
      a. Back to Back
      b. Welded
      c. Thickness

B. Reinforced Concrete
   1. Precast
   2. Cast in Place

C. Steel Beams
   1. Welded Wide Flange
   2. Channel Iron

XVI. DOOR AND WINDOW FRAMES

A. Door Frame
   1. Steel
   2. Flush
   3. Wrap Around
   4. Spreaders
   5. Assembly
   6. Masonry Opening

B. Window Frames
   1. Steel
   2. Aluminum
   3. Wood
   4. Masonry Opening
   5. Lintel Placement

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

XVII. REPAIR AND MAINTENANCE

A. Pointing
B. Bonding Agents
C. Caulking
D. Water Proofing
E. Hydraulic Cement

XVIII. MISCELLANEOUS ASSIGNMENTS

A. Plastering
B. Stucco
C. Pre-stressed Concrete
D. Cleaning
D. Pargeting
F. Wall ties and Dur-A-Wall

XIX. CUSTOMER RELATIONS AND BUSINESS PRACTICES

A. Dress and Appearance - First Impressions
    1. Clothing
        a. Neat
        b. Clean
    2. Personal Appearance
        a. Cleanliness
        b. Personal hygiene
        c. Manners
            1. Polite
            2. Tactful

B. Courtesy to the Customer
    1. Telephone Communication
        a. Courteous
        b. Sincere
        c. Listen
        d. Never argue but stand on facts
        e. Misuderstanding produces ill will

LESSON PLAN NO.	DATE SCHEDULED	DATE PRESENTED	DATED TESTED

XIX. CUSTOMER RELATIONS (Continued)

2. Association in Person
    a. Call customer by name
    b. Pronounce name correctly
    c. Efficient service
    d. Brief, thorough
    e. Satisfy complaints
    f. Enthusiasm about company
    g. Enthusiasm about product

C. Customer Psychology
1. Get the customer's story
2. Agreement precedes disagreement
3. Knowledge of product
4. Ignorance kills customer confidence
5. Show initiative

D. Business Practices
1. Maintain good records
    a. Customer files
    b. Service calls
    c. Time spent
d. Parts used
e. Billings
f. Correspondence
g. Inventory
h. Service bulletins
i. Cost (all taxes)
j. Taxes (all taxes)
k. Gross income
l. Net profit

E. Ethics
1. Workmanship
2. Parts Cost
3. Labor cost
4. Overhead cost
5. Promptness
6. Contractual and implied obligations
7. Customer consideration

RECORDING STUDENT PROGRESS

A major principle of vocational education is that the students learn skills or the performance of operations of a trade with the production job as a vehicle to accomplish this objective.

The operations are defined on the shop progress record and it is imperative that the instructor have some means of recording the student experiences and achievement.

The approved method of recording student progress is as follows:

Instructed - This designation on the progress record indicates that the student has performed a skill with the assistance of and under the supervision of the instructor.

Practiced - This designation on the progress records indicates that the student has performed a skill either by himself or with little help from the instructor.

Proficient - This designation on the progress record indicates that the student is capable of performing a skill by himself within a reasonable amount of time with no assistance from the instructor. In effect this implies that the student has been tested for the skill.

This method of noting student progress will define accurately student achievement and in fact will point out any weaknesses the student may have in certain operations; thus highlighting areas where the student may need help.

Grades should be kept on student daily progress cards or in roll books.

Grade ..... Year ..... Instructor .....

STUDENT	TOOL CHECK NO.	LOCKER NO.	TEXT BOOK NO.	SHOP GRADES MARKING PERIOD						THEORY GRADES MARKING PERIOD					
				1	2	3	4		F	1	2	3	4		F

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Grade ..... Year ..... Instructor .....

TOOL CHECK NO.	LOCKER NO.	TEXT BOOK NO.	SHOP GRADES MARKING PERIOD						THEORY GRADES MARKING PERIOD					
			1	2	3	4		F	1	2	3	4		F

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BLOCK CORNERS								BLOCK WALLS							
Build 4''	Build 6''	Build 8''	Build 10''	Build 12''	Maintain Height			Build 4''	Build 6''	Build 8''	Build 10''	Build 12''			

Build Common	Build Flemish	Build Dutch	Build English	Build Garden Wall	Build Stacked	Build Herringbone	Build Basketweave							

Build Arch Center	Build Segmental Arch	Build Gothic Arch	Make Cuts					Use detergents	Use acids	Use Sure-Clean				

Concave Joint	Convex Joint	Weather Joint	Rake Joint	Flush Joint					Place Reinforcement	Grout				

MORTAR

BRICK

Hand Mix	Machine Mix				Lay to a line	Build Leads	Build with Headers	Install Wall-Ties	Install Dur-A-Wall					

CEMENT FINISH AND STUCCO

LINTEL AND BEAM CONSTRUCTION

Apply pargeting	Apply cement mortar	Use rubber float	Use cork float					Set angle irons	Set steel beams	Set pre-cast concrete lintels				

STONE

Lay field stone	Lay cut stone	Lay slate	Lay blue stone	Build Quoin Corner	Build Bolt Course	Clean stone								

Point	Apply bonding agents	Caulk	Apply waterproofing	Use hydraulic cement			Plaster	Stucco	Wash down	Parge	Install Wall-Ties	Install Dur-A-Wall		

HEATILATOR

DOOR AND WINDOW FRAMES

Install Heatilator	Install Insulation	Build Air Tunnels	Install Fans	Build Throat				Cut openings	Install door frame	Install window frame	Install lintels			

Lay brick and block	Lay brick and stone	Lay block and stone	Lay brick and glazes tile	Install Dur-A-Wall	Install Wall-Ties					Layout and Design	Install Grills			

CEMENT FINISH AND STUCCO

LINTEL AND BEAM CONSTRUCTION

Apply pargeting	Apply cement mortar	Use rubber float	Use cork float					Set angle irons	Set steel beams	Set pre-cast concrete lintels				

STONE

Lay field stone	Lay cut stone	Lay slate	Lay blue stone	Build Quoin Corner	Build Belt Course	Clean stone								

CHIMNEY

MASONRY SAW

Layout and Design	Install clean-out doors	Install Thimble	Install Concrete Cap	Install Flashing	Install Flue Liner					Use Wet Blade	Use Dry Blade			

FIREPLACES

Layout	Build Ash Pit	Build Ash Dump	Build Firebox Floor	Build Firebox	Build Hearth	Build Smoke Shelf	Build Smoke Chamber	Build Clean-out Doors	Build Flue Liners	Build Face	Install Thimble			